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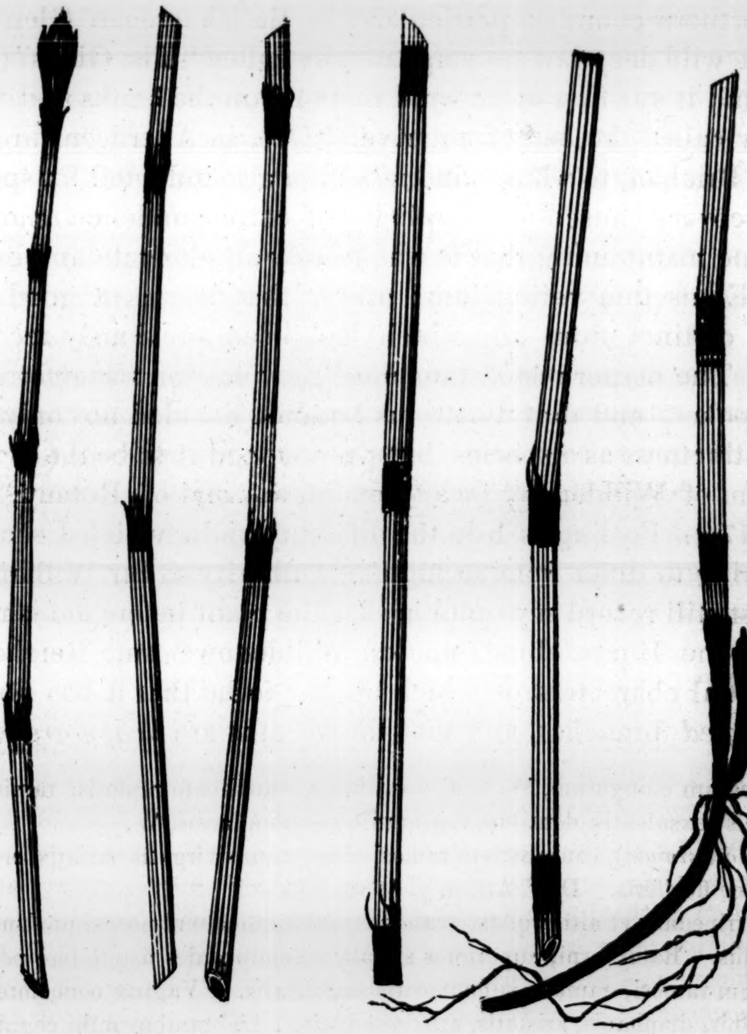
ART. LXXXI.—*A History of the British Equiseta.* By EDWARD NEWMAN. (Continued from p. 278).



MACKAY'S SHAVE-GRASS.

EQUISETUM HYEMALE, *β.* MACKAII,* *Newman.*

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* Named after the original discoverer, Mr. J. T. Mackay, of Dublin.

THIS plant occurs in the North of Ireland, more particularly in the counties Derry and Antrim. It was originally discovered in the year 1833, by Mr. Mackay, the well-known author of the 'Flora Hibernica,' when in company with Mr. Whitla, in Colin Glen, near Belfast. Subsequently to this date it has been repeatedly observed by different botanists: Mr. Moore, the talented and energetic conservator of the Dublin Glasnevin Garden, to whom I am indebted for a supply of both recent and dried specimens, has found it in many of the glens in the northern counties, particularly in Ballekavregan Glen (Derry), and in the wild deep ravines emphatically called "The Glens" (Antrim). In Scotland it was first discovered in 1841, on the banks and "in what is usually called the bed of the river" Dee, in Aberdeenshire, by the Rev. Mr. Brichan, to whose kindness I am also indebted for specimens.

Its discovery caused a multiplicity of correspondence among botanists, some maintaining that it was merely an elongate and exuberant form of Equisetum variegatum; others that it was a good species, perfectly distinct from any which had been previously recorded as British. The matter rested thus until the question was referred to Sir W. J. Hooker, and that illustrious botanist decided not only in favor of its distinctness as a species, but pronounced it to be the Equisetum elongatum of Willdenow, (see 'London Journal of Botany,' 42, and Phytol. 174). Feeling as I do the difficulty under which I shall labour in venturing to differ from so high an authority as Sir William Hooker, I must still record my opinion that the plant before me is not identical with the Equis. elongatum of Willdenow[*] and Reichenbach,[†] the essential characters of which appear to be that it has *verticillate* and 6-*angled* branches, and that the sheaths are *hoary green*, concolorous with the internodes: I have faithfully transcribed both of the original descriptions. Moreover, on consulting Professor Vaucher's 'Monographie des Prêles,' published in the first volume of the 'Mémoires de la Société de Physique, etc. de Genève,' I find that learned author has not only described at length but figured (Pl. VI.) Willdenow's plant under Desfontaine's prior name of Equisetum ramosissimum: the subduplicato-ramose and verticillate characters of the stem as well as the concolorous sheaths are well represented. Vaucher gives the appropriate name of Equisetum multiforme to a species which appears to include the variegatum of Schleicher's Catalogue and various other forms, among these the present plant is not distinctly characterized: his *β*. Equisetum multiforme ramosum, which, in other respects, comes the nearest, having the sheaths differently coloured.— His description of this variety is quoted below.*

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[*] Equisetum elongatum, W. E. caulibus subduplicato-ramosis, ramis subternis scabriusculis sexsulcatis, dentibus vaginarum membranaceis, W.

E. (*ramosissimum*), caule striato ramosissimo, ramis virgatis striatis erectis verticillatis, apice floriferis. Desf. Atl. ii. p. 3982.

Caulis tripedalis et altior quasi scandens, subduplicato ramosus, profundè striatus, scabriusculus. Rami terni, superiores simplices semipedales usque ferè pedales, inferiores iterum ramosi, ramulis suboppositis sexsulcatis. Vaginæ concolores dentatæ, dentibus albis, diaphanis, aristatis, aristis caducis. Ab omnibus mihi cognitis abundè diversum. Equisetum ramosissimum Clariss. Desfontaines non differre videtur. Willdenow, Sp. Pl. v. 8.

[†] E. elongatum, W. caule ramulisque sexangularibus longissimis superioribus spiciferis, spica mucronata, vaginis concoloribus (cano-viridibus), dentibus persistentibus albis vix puncto sphacelatis cartilagineis, in acumen quasi fimbriam longissimam hyalinam flaccidam deciduam productis.

Hyemale, β. procerum Pollin et omnino vix recedere video.

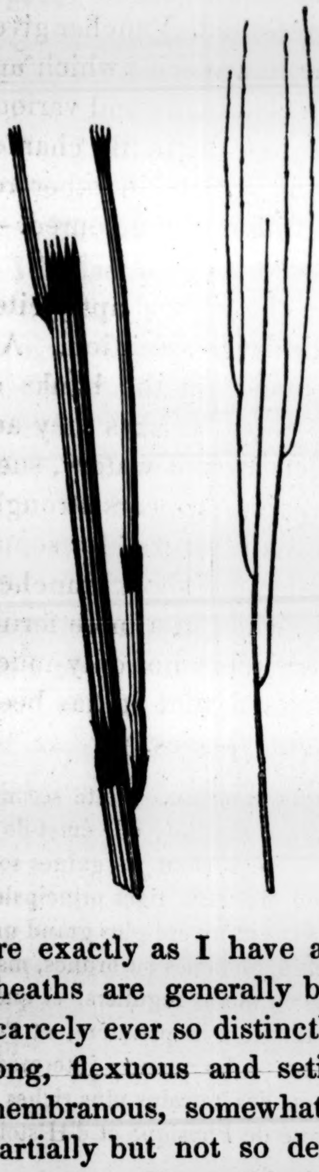
Quadripedale et altius quasi scandens ramuli ultra pedales. Flor. Germ. Exc. 155.

This author, in his introductory remarks on the genus, aptly cites this species as an instance of characteristic liability to variation. After mentioning that the Equiseta generally occur on the banks of streams and in damp places, as well as in the water, he says they are occasionally "even met with in sandy places that are not watery, such is the case with Equisetum multiforme: this species appears strongly influenced by the properties of the soil in which it grows, for sometimes it throws out but a small number of slender and short branches, at other times, on the contrary, and especially when in a more fertile soil, we find issuing from the principal stem branches not only much longer but much more divided, so much so indeed that it has been thought it could not then be referred to the same species."†

* *β. Equisetum multiforme ramosum.* Prêle multiforme rameuse. Cette seconde variété est peu connue des Botanistes quoiqu'elle soit assez répandue; elle émet de sa racine plusieurs tiges courtes semblables à celles de la variété *a.* dont les gaînes sont plus ou moins noirâtres; mais on y observe encore une ou plusieurs tiges principales, qui peuvent s'élever jusqu'à trois pieds et qui sont terminées par un épi plus grand que celui de la variété *a.* Les gaînes sont amples, assez lâches, blanches ou brunes, mais rarement noires; les rameaux sont assez nombreux, plus ou moins réguliers, et quelquefois prolifères. Cette variété *β.* se trouve souvent réunie à la première, et l'on peut facilement observer des échantillons qui présentent toutes les nuances intermédiaires. Ordinairement la Prêle rameuse se rencontre dans des terrains plus riches et plus favorables à la vegétation.—'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève.' i. 379.

† On en rencontre même dans les terrains sablonneux et non humectés, comme par exemple la Prêle multiforme; mais cette dernière espèce paroît être fortement influencée par la nature du terrain dans lequelle elle croît, car tantôt elle ne développe qu'un petit nombre de tiges grèles et fort courtes, tantôt au contraire, et surtout lorsqu'elle sort d'un terrein plus riche, on voit sortir de la touffe principale des tiges beau-

The roots and rhizoma present no characters by which I can distinguish this plant from that previously described as the normal form of the species: they are both black, the roots being tortuous, much divided, and often clothed with minute and matted fibrillæ: the stems are very long, generally erect, nearly straight, and jointed as in the former species; the figure shows a perfect stem divided into six portions, its size and the relative length of the internodes having been copied with scrupulous accuracy. Both the internodes and sheaths are striated; the striæ vary in number from eight to twelve, or even fourteen. The stem is hollow, with the exception of the transverse septa occurring at the sheaths. Instead of being uniformly simple, as represented in the figure at the head of this article, it is often sparingly branched, as shown in the left hand figure; the branches rise singly from below one of the sheaths, and a stem often bears two or three such branches, the branches themselves also occasionally emit other branches in the same way, the plant, in that case, being very luxuriant, and attaining a height of three to four feet: the right hand figure is a diagram showing the mode of branching. Under the microscope the structure of the stem appears precisely identical with that of E. hyemale; the double row of elevations on each of the ridges, with their cup-shaped depressions in the centre, are exactly as I have already described them, (Phytol. 278). The sheaths are generally black, the central part sometimes white, but scarcely ever so distinctly banded as in hyemale: the teeth are very long, flexuous and setiform; their edges at the base are dilated, membranous, somewhat whitish, and nearly transparent; they are partially but not so decidedly deciduous as in the normal form of hyemale. The catkin is small, nearly black, apiculate, terminal, and striated as in hyemale: the scales are about thirty in number.



EDWARD NEWMAN.

(To be continued).

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coup plus grosses et plus ramifiées, qu'on croiroit ne point appartenir à la même espèce. —Id. 333.

Art. LXXXII. — *On the authority upon which several Plants have been introduced into the 'Catalogue of British Plants' published by the Botanical Society at Edinburgh.* By Charles C. Babington, Esq., M.A., F.L.S., &c.

1. *Alchimilla conjuncta*, Bab. MSS. A. argentea, *G. Don, MSS. in Borr. Herb., Trevelyan in Edinb. New Philos. Journ.* 1835, *not Lam. Enc. i.* 77.

Gathered by the late Mr. G. Don on the Clova Mountains, as I learn from an original wild specimen in Mr. Borrer's herbarium. As the name originally applied to this plant by Mr. Don (but not published) had been previously employed by Lamarck for another plant, it has become necessary, in order to avoid confusion, to give a new name to this species.

Closely allied to A. alpina, but usually much larger in all its parts, and distinguished by its leaflets not being separated down to their base, broader, more silky on the under side, and so placed that in the radical leaves the two external leaflets almost, if not quite, touch each other.

2. *Alyssum calycinum* has maintained itself for several years on uncultivated spots in Scotland, and is therefore possibly a true native of that country, although an introduced plant in England. See Eng. Bot. Suppl.

3. *Betula glutinosa.* This is the more common species in the northern parts of Scotland.

4. *Bunium Bulbocastanum.* Plentiful in the chalky fields of Hertfordshire and Cambridgeshire. See Eng. Bot. Suppl.

5. *Carex irrigua.* I have gathered this plant upon Muckle Moss, Northumberland. It is distinguished from C. limosa by having flat leaves, with their margins scabrous only near the end, usually three female spikes, fruit without striæ, and the scales of the catkins without the longitudinal green band which is seen in that species. This plant is well figured in Hoppe's 'Caricologia Germanica.' It was first noticed in the above station by Mr. John Thompson, of Crow Hall Mill, near Ridley Hall, Northumberland.

6. *Centranthus Calcitrapa.* This has but slender claims to be considered as a British plant, as it has only been found in a naturalized state at Eltham (?) in Kent.

7. *Echinospermum Lappula.* In small quantity at Southwold in Suffolk, where it was discovered by the Rev. E. A. Holmes.

8. *Epilobium lanceolatum*, (Seb.) This is the E. montanum, var. γ. *lanceolatum*, of my Prim. Flor. Sarn., which was there considered as a variety owing to my supposing that the plant of Koch was the same as that of Sebastiani. Bertoloni has since shown that Koch's plant is, as he supposed, a variety of E. montanum, but that the true E. lanceolatum, with which ours agrees, is a distinct species.

9. *Eranthis hyemalis.* Only a naturalized species.

10. *Erysimum virgatum.* In the neighbourhood of Bath the place of E. cheiranthoides is supplied by this plant.

11. *Galium insubricum.* I look upon this as rather a doubtful species; it being too closely allied to G. Mollugo. Found near Winnander Mere several years since by the Rev. C. A. Stevens.

12. *Gentiana germanica.* Stated by Dr. Grisebach to be common in Britain; I am inclined to consider it only a variety of G. Amarella.

13. *Hieracium lævigatum.* I am now convinced that this plant is not the species intended by Willdenow, but that it is the H. rigidum of Hartmann and Fries. It is found in many places.

14. *Linaria purpurea.* Only a naturalized plant.

15. *Malcolmia maritima.* In my opinion this plant has no just claims to be included in the list.

16. *Melissa officinalis.* Naturalized in many places.

17. *Nasturtium anceps.* A common and distinct species.

18. *Oxalis stricta.* Naturalized at Penzance, in Cornwall.

19. *Pinguicula longicornis*, (Gay ?). An apparently distinct species, found by Mr. Jos. Woods in a valley near Helvellyn, and called by this name, of which there is no trace in any of the works to which I have access.

20. *Rumex scutatus.* Near Edinburgh: a very doubtful native.

21. *Scirpus parvulus.* Found in Hampshire, and probably overlooked in other places owing to its minuteness.

22. *Scrophularia Ehrharti.* An account of this plant will be found in the 'Annals of Nat. Hist.' v. 1. It has been observed near Edinburgh, Berwick-upon-Tweed, Preston and London.

23. *Teucrium regium.* It is much to be feared that some mistake has occurred in stating that this plant grows on the Blorenge, near Abergavenny, as the exact spot on which it is believed to have been gathered, has been examined carefully by a distinguished botanist, but without success.

24. *Trifolium Bocconi.* Found by Mr. Borrer and myself near the Lizard Point in Cornwall.

25. *Urtica Dodartii.* Found in Cambridgeshire, Norfolk and Essex.

26. *Vicia gracilis*. A native of Somersetshire and the Isle of Wight, first recorded as British in the Supplement to the 'Flora Bathoniensis.

C. C. BABINGTON.

ART. LXXXIII. — *Analytical Notice of the 'Transactions of the Botanical Society.' Vol. i. pt. i.* Edinburgh: Machlachlan, Stewart & Co.; H. Baillière, London; Smith & Son, Glasgow; W. Curry, jun. & Co. Dublin; J. B. Baillière, Paris; J. A. G. Weigel, Leipzig. 1841.

(Continued from p. 291).

II. *Account of Botanical Excursions from Edinburgh in Autumn* 1839. *By* ROBERT GRAHAM, M.D., F.R.S.E., F.L.S. & B.S., *Professor of Botany in the University of Edinburgh.*

ONE of these excursions was commenced on the 2nd of August: the first plant mentioned is the rare moss Diphyscium foliosum, which Dr. Greville observed in great quantity and fine fruit—"by the roadside, in many places both to the north and south of Loch-Earn-Head." Carex vesicaria was also found in large quantities at the head of Loch Lubnaig, "towards the village called Nineveh or Strath-Eyre." Dr. Graham doubts the accuracy of the statement that the latter plant, with Lysimachia vulgaris and Lythrum Salicaria occur sparingly near Edinburgh. Of the vegetation on the mountains beyond Milgurdy the author remarks: —

> "In general the alpine vegetation was found to be very scanty, except Gnaphalium supinum, which here, as on almost every mountain of considerable elevation in Scotland, was abundant. Azalea procumbens was in considerable quantity, though much less abundant on the Breadalbane mountains than in many other stations in Scotland. Erigeron alpinus, Salix reticulata and Saussurea alpina were found sparingly on the most distant mountains which we visited. Hieracium alpinum was also scarce, but more diffused. Carex saxatilis was abundant, especially on the north side of the mountains below the summits, and at the base of a steep wet cliff there, Mr. M'Nab found Epilobium alsinifolium (?) In bogs, on the north side of the mountains, below the summits, we also found Juncus biglumis."—p. 20.

In their route to Catjaghiamman the party observed nothing "but a sparing quantity of the ordinary alpine plants, and a few fine specimens of Woodsia hyperborea, Myosotis alpestris and Veronica saxatilis," Juncus castaneus being abundant in one place. Tempestuous weather prevented the party from thoroughly examining the summit of Catjaghiamman, of which the author observes: —

> "I feel quite certain that this is untrodden ground, for no collector could have left such specimens as we gathered of Draba rupestris; specimens many times larger than I ever saw before, except some which I found at no great distance on the same ridge, during the last visit which I paid to that district."—p. 21.

On the south side of Ben Lawers Dr. Greville and Mr. M'Nab found the only specimens of Azalea procumbens seen on the whole range, except those found to the north-west of Milgurdy. Sedum villosum occurred at a much greater elevation than the author had before observed it in. Gentiana nivalis was found in considerable abundance at the base of the rocks; and—

> "Among shelving rocks, near the bottom of the hill, and to the eastward of the wood above Finlarig, I gathered Eriophorum gracile. This I think certainly the plant indicated by Don, and figured by Smith in 'English Botany,' and it was even at a distance easily distinguished from Eriophorum angustifolium, among which it grew; but whether it is entitled to rank as a species is quite another question. I do not think it a scarce plant, at least in the north of Scotland. I am sure I have seen it in large quantities in Sutherlandshire."—p. 22.

At Inverarnan Drs. Graham and Greville collected specimens of the oaks which grow there, in the expectation of finding among them the true Quercus sessiliflora, which the former gentleman thought he had seen in that locality on a former visit.—

> "In spite of our receiving a shower-bath with every twig we pulled, we persevered as long as we saw the least chance of clearing up a doubt about the species of this most important genus; but we were obliged to desist, with only a strong suspicion that my conclusion regarding the sessile-flowered oak was hasty. Whatever character may be got for this supposed species, I fear at present that the form of the leaf will yield none, for I certainly saw trees with leaves which I should have considered characteristic of Quercus sessiliflora, which nevertheless had peduncles several inches long. It was too dark to judge of habit, in which also, in my former visit to this district, I conceived I had seen a character."—p. 23.

In a second excursion, during a walk by the bottom of Loch Eck to Kilmun, the author observed "nothing worth mentioning except a profusion of Carum verticillatum in almost every damp pasture," and a great quantity of Polygonum amphibium, var. β. terrestre, in flower. Ben More, the highest mountain in Cowal, the author found to be most unproductive of alpine plants; this could hardly have been expected, the whole country being micaceous and wet, but an inspection of the district explained the cause.

> "The rocks are not crumbling, but present the same forbidding sharp angles as those we had before seen in Glen Ogle. We got absolutely nothing worth naming in our ascent. We descended by a crumbling ravine in a cliff where eagles build, and

got there the only things worth notice. Among these were Aira alpina, Poa glauca, Alchemilla alpina, Galium boreale, Saxifraga oppositifolia, S. stellaris, S. nivalis (three or four specimens only), S. aizoides, Cochlearia officinalis, Carex rigida (very little in fruit), C. pallescens, Luzula spicata, Salix herbacea, Saussurea alpina (on one spot only), Aspidium spinulosum in various forms, Asplenium viride, Hymenophyllum Wilsoni in abundance, and in moist pasture, some way up the mountain, Carum verticillatum."—p. 24.

The last excursion mentioned is that by Messrs. Brand and Campbell in September, from Edinburgh by Perth and Dunkeld to Blair Athol, thence to Cawdor Castle in Nairnshire. On Craig-y-Barns, a hill north of the park at Dunkeld, Saxifraga umbrosa was observed covering acres of ground, and in some places forming the entire turf to the exclusion of everything else, with every appearance of being native; but the presence of Hypericum calycinum and other certainly introduced plants, induced our travellers to believe that the Saxifraga had been planted there, though at a remote period. From the Sow of Athol Menziesia cærulea has been nearly eradicated, only two plants having been found after a long search: at the foot of the mountain Carex pauciflora was abundant. In one place by the roadside between Dalnacardoch and Blair occurred what was considered to be the true Arctium Bardana, a plant so distinct from A. Lappa, that the propriety of sinking it as a species is questioned. But while an old specific distinction might thus be restored, the travellers seem disposed to discard a new one: for Rumex aquaticus, found frequently near Cawdor Castle, on being examined in different situations, was thought to "shade away *towards*, if not *into*, Rumex crispus." Among other good plants abounding in the Cawdor woods were Rubus saxatilis, Goodyera repens and Trientalis europæa; the latter is sometimes of "remarkable size; Mr. Stables having one plant whose branches, spread out, measured about one foot square." Lapsana pusilla and Lolium temulentum were observed near Elgin, usually among wheat.

"Mr. Gorrie has been the first to discover Orobus niger in the Pass of Killiecrankie, scattered over a piece of ground in the coppice wood, at least twenty yards across, and far removed from any cultivated ground."—p. 26.

III. *Observations on a Metamorphosed Variety of Antirrhinum majus. By* HERBERT GIRAUD, M.D., *Member of the Council of the Botanical Society.*

"The general growth and habit of this plant corresponded with its normal condition, and the stems, leaves and sepals answered to their specific characters. But the petals, with the other parts of fructification, existed in a state of very singular transformation, — affording a striking illustration of the great doctrine of morphology,—

that the organs of reproduction, with their appendages, are but metamorphosed leaves. * * The points in which this plant departed from its normal condition, appear to be these: — The corolla, instead of being petaloid, irregular, five-cleft and brightly coloured, was leafy, regular, in five deep segments, of a green colour. The stamens, which should have been didynamous, were here absent. The ovarium, from being two-celled, became five-celled; the stigma five-cleft, instead of bifid; and the style hollow, instead of being solid.

"The quinary condition of the ovarium, and the alternation of its carpels with the divisions of the corolla, is a state which would be expected to follow any alteration in the number of its cells, with an accompanying tendency to assume regularity in its development; as the quinary arrangement is that which prevails in dicotyledons. The supernumerary carpellary leaves, of which the ovarium is composed, are obviously those which, under the normal condition of the plant, would have gone to the formation of stamens. That they are developed from the next whorl of leaves to the corolla is plain, from their alternating with its divisions. Now, in the normal condition, the stamens would be so situated; one leaf, however, in the whorl is altogether abortive, —forming neither a stamen nor a carpel; for the carpellary development of this would produce a six-celled ovarium. The abortion of stamens in the natural family Scrophularineæ (to which this plant belongs) is by no means unfrequent."—p. 27.

This case of metamorphosis is remarkable as presenting an instance of changes proceeding in opposite directions in the same flower: — 1. from centre to circumference, the bright-coloured irregular corolla having been converted into five equal, green, leafy segments, clothed with glandular hairs, like the calyx: 2. from the circumference to the centre, the stamina taking the form of carpellary leaves. The former of these changes is considered by the author to disprove an opinion expressed by Dr. Lindley, that transformations of the reproductive organs "*always* take place in the order of development, or from circumference to centre; that is to say, that the calyx is transformed into petals, the petals into stamens, &c., but that *the converse does not occur*."

IV. *On the British Species of Fumaria.* *By* Charles C. Babington, M.A. F.L.S., F.G.S., &c.

Mr. Babington, in a paper read before the Society on the 12th of May last, has entered more fully into the specific distinctions of Fumaria parviflora and other allied species of the genus, (Phytol. 239); we therefore think it better to defer our analysis of the present paper until the publication of the second in the Transactions.

V. *On Systematic Arrangement in the Formation of Natural-History Collections.* *By* William Brand, C.S., F.B.S.

Believing that nothing has been created without an object, the author also imagines "that all things exist according to a suitable arrangement, the laws or conditions of which may, in some measure, be ascertained by a well-directed investigation," the first requisite for which is such an acquaintance with the various objects as will enable the enquirer "to recognise and identify them wherever they appear." This knowledge can be gained only "by studying the features of each individual," and can be applied only by the several individuals being characterised, so that each may be distinguished from all others of its class. This may be termed "the process of *separation* or *disjunction;* and an object thus discriminated is termed a *species.*"

The author then briefly treats of "the process of *combination,*" by which species are formed into genera, these again into other groups, and so on, until all the objects in any kingdom of nature are classed under a few grand divisions. These groups, being but interrupted links, "where nature probably exhibits a continuous chain," must be to a certain extent artificial, a separation into *species* or *individuals* being the only real classification indicated in nature. The author meets the objection that naturalists "waste their time and energies upon the external character and appearance of objects, instead of applying themselves to ascertain their relationship, properties and uses," —by remarking that the former is an indispensable preliminary to the successful prosecution of a higher course of research, to the promotion of which a still farther advance must be made, "namely, to ascertain the range or distribution of species, with their relative condition, and other attendant circumstances in any different region of the globe."

> "Now, in prosecuting such an investigation, I consider it necessary to commence by mapping out, or dividing the surface of the globe into appropriate sections; then to ascertain the various productions which occur in each, with the circumstances attending them; and lastly, to register the information thus acquired, in such a way as to afford a ready and comprehensive view of these productions, both as they exist in any one section, and as they stand relatively to those of other sections."—p. 41.

In forming these sections, although no abrupt or decided change in their productions may be occasioned by topographical influences, yet may certain lines be traced whereby such changes are indicated; such lines would form appropriate boundaries for the sections. Thus the ridge of a mountain chain, a table-land, or the channel of a great river, may sometimes be properly chosen as a sectional line, especially when the former regulate the water-sheds or sources of streams flowing in opposite directions. The sections should be so limited in extent that all the important changes occurring in the productions of a district may be exhibited, while they should "not be so numerous as to render definite limits unattainable, or otherwise obstruct the scheme in its practical working." The author observes that "any mode of division adopted must always be liable to controversy," but that he himself believes "about 110 sections would suffice for the proposed object."

> "This object being accomplished, the next requisite for ascertaining with accuracy the productions of the earth, is to procure specimens of these from *every* section wherein they occur, along with full particulars relative to their condition; and to record those particulars in such methodical array as to make them directly available for the purpose intended. To carry on this process efficiently, however, I consider it essential that the information should be registered immediately on being obtained, or at least as soon thereafter as possible, both that the rapid accumulation of objects in a general collection may not interrupt the regularity of procedure; and because I conceive that a material saving of labour will always be effected by disposing of these objects at once, and singly as they occur."—p. 42.

Mr. Brand considers that the best mode of rendering Natural-History collections easily available, is to record the species in a tabular form under an alphabetical arrangement, employing certain simple signs or marks to indicate all the information obtained respecting them. The author is of opinion that the adoption of this mode of arranging and registering all known facts and circumstances connected with objects of Natural History, must eventually lead to the highest practical results.

VI. *Description of Pothocites Grantonii, a new Fossil Vegetable from the Coal Formation. By* ROBERT PATERSON, M.D., &c., *Extraordinary Member of the Royal Medical Society, and one of the Council of the Wernerian Natural History Society of Edinburgh, &c. &c. Communicated by the President.*

THE fossil which is the subject of the present paper "was found in a mass of bituminous shale, from the coal strata which are exposed along the coast at Granton." The specimen here described and figured is the only one met with during a long-continued series of researches in the locality wherein it occurred; and it appears to constitute an entirely new fossil genus.

At first sight the figure (which is of the natural size) appears to represent about three inches of the lower part of a catkin of Typha angustifolia, attached to a portion of the stem. On a closer inspection, however, it is seen to differ materially from the fertile catkin of a Typha, for in that genus there is no other floral envelope than the hairs surrounding the pedicel of the pericarp; whereas on the exposed surface of the fossil are four longitudinal series of bodies, each of which, in the accompanying magnified views, is seen closely to resemble a four-leaved calyx. Another point in which the fossil differs from Typha is that on the stem, about an inch below the catkin, we observe a scar apparently indicating the spot whence a leaf or spatha had fallen, or where a branch had been broken off; now there is nothing of this kind in Typha. It therefore became necessary to seek in some other genus for the living analogues of this fossil, and these are apparently furnished by several species of Pothos, a genus belonging to the natural order Aroideæ, and characterized by having a one-leaved spatha, and a simple cylindrical spadix covered with flowers, which have a four-leaved calyx, no corolla, four stamina, and bear a 4-seeded berry. These characters will be found to apply nearly to the fossil, making allowance for "the compression it has undergone, and the change of appearance produced by its mineralization."

> "The greatest number of the species of the genus Pothos are parasitic, and inhabit the vast forests of tropical countries. In some of the species, also, there are truncated fleshy scales on each side of the germen, and which, in the young state, completely cover the male organs of the plant; these are especially conspicuous in P. acaulis.—The similarity of the habitats also favours the idea of its belonging to this class of plants."—p. 51.

The author enters at some length on the mode in which the different carboniferous strata have been deposited, and explains the process of formation of fossil fuel in the present era, as observed by travellers in America.

VII. *Extracts from the Minute-Book of the Botanical Society, from November* 1839 *to July,* 1840.

1839, *December* 12. Read, Extracts from a Letter addressed to Dr. Greville, from R. J. Shuttleworth, Esq., Berne, dated 11th September, 1839, containing "Observations on Diatomaceæ." After some observations on Gomphonema, Meridion, Diatoma, &c., the author says —

> "I have no doubt as to the non-animal nature of these and analogous genera; for though I have examined, I may say, tens of thousands of individuals of most of them, I have *never* observed the slightest trace of *spontaneous* motion or action. The motion of Oscillatoria is perfectly mechanical, caused by the rapid development of each successive cell or joint; and an analogous motion, though merely caused by separation of each joint, is common in Diatoma."—p. 53.

Mr. Shuttleworth passed "eight days on the Grimsel, the hospice of which is 6400 feet, or thereabouts, above the level of the sea;" he wished to ascertain if Diatomeæ exist in the alpine waters, which are scarcely above the freezing point.

"I found that every pool or stream was full of them and Infusoria, and even the Scytonema that covered the rocks several hundred feet above the hospice, and over which the snow-water trickled, served as the habitation or matrix of Synedra lunaris, *Ehrenb.* (Exilaria, *Auct.*) a true Diatomea."—p. 54.

The author enumerates many of the species found here, several of which were quite new: he also details the results of an examination of "the Red snow *quite fresh*," which, to his astonishment, he found composed of Protococcus nivalis (*Ag.* not *Grev.*), P. nebulosus, *Kütz.* three or four deep red and two uncoloured Infusoria; "the Infusoria were endowed with the most astonishing activity of motion."

"The coloured snow was collected in a bucket, and then allowed to melt, when the colouring matter was deposited, and immediately examined; but hardly had the water acquired the temperature of the air, than *all life ceased*, and the Alga was only to be distinguished from the Infusoria, by its greater transparency and lighter colour. The proportion of the Alga (Protococcus nivalis) to the Infusoria was about 5 or 6 to 1000 of the latter. That this is always the case I do not believe, as Hæmatococcus Noltii is always mixed with a brown Stentor, which latter varies in its proportion much. The Protococcus nivalis of the Grimsel is the same plant as that figured by Agardh, in the 'Icones Alg. Europ.' tab. 21, f. a. The sporules, or rather the contents of the plant, are merely grumose, and the granules are so small, as to be even inconspicuous with a power of 300 diameters, whereas in Hæmatococcus Noltii (to which your species of red snow is closely allied) the granules are large, and few in number. The Protococcus nebulosus, *Kütz.*, is a simple, very small, grey or uncoloured globule, which abounds everywhere, and as, from mechanical causes, it is attracted round the globules of red snow (Alga and Infusoria), it is certainly the cause of the gelatinous appearance of the substratum, described and figured by many authors, which however does not exist in our Swiss plant. The colouring matter of the red snow extends to the depth of eight inches at least below the surface; it is only found on *old* snow of some years standing probably, and only developes itself during warm weather and a southerly wind. This snow is also always more or less covered with minute particles of humus; and I regret that the state of the weather did not permit me to examine the humus immediately below the snow."—p. 55.

There is also a reference to a paper by Mr. Shuttleworth published in the 'Bibliothèque Universelle de Genève,' Feb. 1840.

Exhibited, by Mr. W. C. Trevelyan, a series of varieties of Scolopendrium vulgare, gathered at Auchmithie in Forfarshire. The most frequent form is that with a simply bifid termination; one specimen is three-cleft; in others the midrib being divided near the base "forms a frond with two branches, nearly at right angles with each other;" in another specimen the frond is much branched at the extremity; then again some have a rounded termination, the midrib not reaching to the end, and other fronds have a circular form; the edges of some fronds are fimbriated, of others crenated; and in one remarkable variety the frond is much thickened, and the veins are more distant than usual, "there being about one-third only of the usual number in a given space."

1840, *February* 13. Read, a Communication from the Rev. C. A. Stevens, Kent, on Scrophularia aquatica of Linnæus and of Ehrhart. The author, considering the plants of the above authors to be distinct species, has named the latter S. Ehrharti, and thus characterizes them.

"*S. aquatica*, Linn. Leaves cordato-ovate, very obtuse, crenato-serrate, lower ones auriculate; lateral cymes corymbose, many-(8—15)-flowered; sterile filament reniform, nearly round, entire; capsule ovate, rather acute.

"Cymes mostly opposite; peduncles and pedicels glandulose; bracts generally linear, obtuse, entire.

"*S. Ehrharti*, C. A. Stev. Leaves ovate or ovato-lanceolate, somewhat cordate at the base, acute, serrate; lateral cymes divaricating, few-(5—6)-flowered; sterile filament bifid, its lobes divaricating; capsule globose, very obtuse.

"Cymes mostly alternate; peduncles and pedicels hardly at all glandulose; bracts foliaceous, lanceolate, acute, serrate."—p. 57.

There is also a reference to Mr. Stevens's paper on these plants in 'Ann. Nat. Hist.' v. 1.

April 9. Dr. W. B. Clarke read a communication on certain properties existing in Tilia europæa, *Linn.* The author observes that "this plant is remarkable for the immense quantity of mucilage contained in the bark, and for the manner in which the cellular tissue involving it is arranged within the meshes of the ligneous tissue." The mucilage exists in a nearly solid form, but is soluble in water; the spaces in the woody fibre of the inner bark containing the cellular tissue appear to be formed "by the cohesion of the woody tissue in certain parts, and its separation in others, to such an extent, that by the gradual and lateral distension of the earlier layers of the liber in the exogenous growth of the tree, certain spaces are made to intervene between the reticulations of the woody fibre, which are gradually filled up by the development of cellular tissue." A transverse section of a branch exhibits these spaces so disposed in the bark as to present "a series of little conical figures, with their bases towards the circumference of the bark, and their apices in communication with the medullary rays, which traverse the wood of the stem."

The author describes the mode of preparing this vegetable mucus from the bark.

May 14. Read, Observations on Gentiana Amarella, *Linn.*, and G. germanica, *Willd.*; and on Pyrola media, *Sm.*; by P. J. Brown, Esq., Thun. The author states his belief that the much-controverted question of the specific identity or distinctness of the two Gentians is yet far from being settled; and "that it never can be set at rest in the closet, or in any other way than by the continued examination of both plants in a living state, and in their native abodes."

> "Smith, in his 'English Flora' (under G. Amarella), says that G. germanica, W. 'may be a good species, but has not yet been observed in England.' Grisebach, the latest and best authority for the Gentianeæ, has England or Scotland as the country of every variety of Amarella, and near Ripon as a habitat of germanica. His distinctions and descriptions, although apparently available upon paper, will not, however, stand the test of the field, as they fluctuate within the limits of probable variation, as may be judged to be likely when he has four states of each species. Minor distinctions being set aside, there seems to be little more left than *G. Amarella*, ovarium and capsule sessile, calyx-lobes lanceolate, obtuse, *though variable ; G. germanica*, ovarium and capsule stipitate, calyx lobes ovato-lanceolate, acuminate. It is true that in his *characters*, he calls the tube of the corolla of Amarella cylindrical, and of germanica 'sensim ampliata;' but in his *descriptions* he calls them both *obconical*. Every distinction he makes depending on size, form, or proportion of parts, may be found here in the space of a few square yards equally applicable to the one as to the other, our plants varying from two inches to two feet, from quite simple, with one flower, to very much branched, with from 150 to 200 flowers; leaves broad and narrow, blunt and pointed, much more distant from each other than their own length, or quite the reverse; the calyx-lobes, which are avowedly inconstant, vary as much as the other parts, and the question is nearly reduced to the sessile or stipitate ovarium, and capsule. Now, although our plants are, at least in my opinion, decidedly Grisebach's G. germanica, I do not find the stipitate ovarium, and am inclined to suspect it may be a delusory appearance, arising in the following manner. * * * The lower third of the ovarium being destitute of seeds, and at the same time fleshy and succulent, I suspect that when gathered in an early stage of flowering, or later if much pressed and dried very quickly, the ovarium shrinks uniformly in drying, and has the sessile form attributed to Amarella; but that when in a more advanced stage, particularly if dried slowly under slight pressure, the substance of the swelling seeds keeps the upper portion of the ovarium expanded, while the lower empty succulent part shrinks and produces the stipitate form of germanica."—p. 59.

The author observes that his attention was drawn to the subject too late in the season to pursue the inquiry satisfactorily; he suggests that botanists should study these plants "from the commencement to the end of their flowering season, drying specimens at stated intervals of about a fortnight, and noticing the form of the ovaria in the living and dried states." In this recommendation we most heartily concur, and should be glad to learn the results. Mr. Babington's opinion on G. germanica is recorded in the present number (Phytol. 310).

The author's idea relative to the ovarium of Gentiana germanica, was suggested by his observations on Pyrola media, which appears to be a rare plant in Switzerland. In June, 1838, the author chanced to find a tolerable supply about five miles from Thun. The plants agreed pretty well with the characters given, except that the style instead of being club-shaped was decidedly cylindrical. In the progress of drying however this difficulty was explained "by the conversion of the cylinders into clubs," whereby the character most insisted on was shown to be false.

> "The styles, which are considerably elongated, and although declined, are scarcely curved, have a diameter at least twice that of P. rotundifolia, and are very succulent, being furnished with a stout ring at the apex, as in the last-named species. In the individuals gathered while the flowers were yet young, the rigidity of this annular protuberance prevented the summit of the style from shrinking, and it consequently became club-shaped when dry; but in those which were further advanced, the ring having become more or less flaccid, it ceased to afford the same resistance, and the styles remained nearly cylindrical, although shrunk to half their original thickness. This view is now confirmed by British specimens in my herbarium. One from England, gathered when the plant was coming into flower, has a style nearly triangular; the other six, from different Scottish stations, are all in fruit, and have all the styles, excepting one, cylindrical, and that one not far from being so."—p. 61.

June 11, 1840. Read, Notice of the Occurrence of several Rare Cryptogamic Plants on the Sidlaw Hills; by Mr. William Gardiner, jun., Dundee. The following is a list of the plants, with their localities.

1. *Buxbaumia aphylla*, Linn. Northern declivity of one of the hills; May. "It grew very sparingly on several small spots of bare soil that occurred among the heath."—p. 62.

2. *Parmelia physodes*, Ach. Deerhill Wood; end of March. "The tree state of this lichen, as far as I have observed it, differs from that found on walls and stones, in being of smaller size, more deeply divided, of less dense growth, and of a clearer colour above, with its under surface darker. Only one specimen was found with the apothecia fully developed."—Id.

3. *Dicranum squarrosum*, Schrad. "Marshy banks of a small lake at the west side of the White Hill of Auchterhouse;" associated with Weissia acuta, Hypnum aduncum and H. revolvens, and "near it was abundance of Polytrichum commune and yuccæfolium. The P. commune β. attenuatum, though said to attain only the height of three or four inches, is frequently as tall as the other variety, sometimes above a foot high."—Id.

4. *Hypnum fluitans*, Linn. "Near the source of Dryburn rivulet, which flows from the Sidlaws into Glen Ogilvy. There were a good number of capsules on it but immature."—Id.

5. *Ramalina farinacea*, Ach. "Found in Deerhill Wood, with apothecia."—Id.

6. *Cetraria islandica*, Ach. "On the top of an old wall, at the foot of the White Hill of Auchterhouse."—Id.

July 30. Read, Notice of Recent Excursions in the Neighbourhood of Edinburgh; by Dr. Graham.

> "Dr. Graham stated that Epilobium alsinifolium, said to have been found on the Ochil Hills, appeared to him to be only a variety of E. tetragonum; that Salix herbacea and Gnaphalium supinum had been found sparingly on Ben Clach, a mountain of that range; and that Galium pusillum, Rubus Chamæmorus, Polygonum viviparum, Lycopodium Selago and selaginoides, had been gathered in the same locality.
>
> "Dr. Graham also mentioned that he had found several fine specimens of Orobanche rubra on the cliffs below St. David's, Fife, and one specimen of Anthemis tinctoria on ballast-heaps near the same place. Epipactis ensifolia he stated to have been found near Dunfermline by a lady."—p. 63.

Dr. Herbert Giraud read a paper "On the Existence of Nitrogen in Plants, considered with reference to their development, and to their serving as food for animals." The author first pointed out the relations of nitrogen in the constitution of organized beings, and that it "appears to be the most essential element of organization." That all the tissues of plants contain nitrogen, is shown by the experiments of the author, as well as by those of Boussignault, Payen and Rigg; who have also proved "that vegetables have the power of deriving that element from the atmosphere." The proportion of nitrogen varies from about three to five per cent. Speaking of M. Boussignault's researches the author remarks:—

> "The results of his experiments have shown, that the proportion of nitrogen in any vegetable tissue or organ, bears an intimate relation to the activity of the vital functions with which the tissue or organ is endowed. Thus, in that part of the seed in which germination commences, nitrogen predominates. Seeds also, which germinate most readily and most rapidly, contain the largest quantity of nitrogen. With regard to woody structures, it appears that the alburnum, which greatly exceeds the heart-wood in the activity of its functions, contains by far the largest proportion of nitrogen. Those timbers also, which grow most rapidly, contain the largest proportion of nitrogen."—p. 64.

(To be continued).

ART. LXXXIV.—*Notice of the 'Transactions of the Microscopical Society of London.' Vol.* i. *pt.* i. London: Van Voorst. 1842.

THIS part, containing 86 pages Royal 8vo. and illustrated with 8 plates, has just been laid before the public, and affords ample evidence of the active and industrious spirit which animates this young but prosperous Society. The papers are twelve in number; seven of these are zoological, four botanical and one geological. We give a short analysis of the botanical papers in the order in which they occur.

I.—*On the Development of the Vascular Tissue of Plants.* By Edwin J. Quekett, F.L.S., B.S., &c.

Mr. Quekett commences his paper by commenting on the difficulties attendant on the enquiry; and observes that he believes the idea to be in great measure correct, that "in structure vessels differ but little from cellular tissue, and that the elements of which the latter is formed are only altered and converted to fulfil a different function in the former, and that the development of the one will more or less correspond to that of the other." He then proceeds to give the views of Schleiden, Raspail, &c., and alludes to the opinion of Mirbel, Treviranus and Slack, that the membranous tube of a vessel is formed from a number of cells ranged end to end, their connexions being ultimately absorbed, thus causing the production of a continuous cylinder instead of several separate cavities. Pursuing this idea the author thus proceeds:—

> "I must state that in many instances I have met with arrangements of cells in such a way as would lead one to suspect that this was the true origin of a vessel; and it is a curious fact that cells adhere end to end much more strongly than they do side by side; therefore, when disturbed, they appear more frequently in strings than in other forms: but I believe no one has ever seen the fact farther than here described, or followed out the complete development of a vessel from this condition of cells; and there is one fact presently to be mentioned, connected with the development of a vessel, which entirely disproves this theory."—p. 3.

In order to watch the development of the membranous tube of a vessel, Mr. Quekett recommends that some part of a plant in a nascent state, as a bud or bulb, should be selected for examination; he also lays great stress on the necessity there is for caution in making dissections of recent parts in order to witness the appearances which he subsequently describes. The author then details observations for the most part confirmatory of Schleiden's views, as explained by that writer in his memoir on Phytogenesis, a translation of which appeared in the 'Annales des Sciences Naturelles,' (tom. xi. Botanique): he continues:—

> "When the young vessels are recognized (which by experience becomes an easy matter, even in parts considerably developed, though not so at first), they appear as pellucid glassy tubes, with a cytoblast in some part of their interior; earlier than this they are not to be recognized readily from cells. As they grow older the cytoblast diminishes, and the contents, which at first were clear and gelatinous, become less transparent from containing thousands of granules, which are too small to allow of the passage of light, and consequently appear as dark points; these atoms are about the $\frac{1}{30000}$ of an inch in diameter, and have the motion known as "active molecules." If the vessel be wounded at this period the gelatinous contents pour slowly out, and then the

singular movements of these molecules are still more clearly seen. These atoms, from their freedom of motion, are arranged indiscriminately in the interior of the vessel, but in a short time some of them enlarge, and then transmit a little light, which, on account of their minute dimensions, is not suffered to pass as a white pencil, but is decomposed in its course, the granule thereby becoming of a greenish hue. The granules exhibiting this greenish hue are now in a fit state to enter into the composition of the fibre that is to exist in the interior of the membranous tube, and in a spiral vessel this is the manner in which this act is accomplished.

"The granules which are in active motion in the viscid fluid near one of the ends become severally attracted to the inner wall of the vessel, beginning at the very point; those granules first attracted appear as if cemented to the spot, by the viscid fluid in that direction losing some of its watery character, for there appears a string of a whitish colour, besides granules, in the line which the fibre is to occupy. As the other granules are attracted to those already fixed in an inclined direction, the spiral course is soon to be seen, and the same action progressively goes on from the end it began towards the other, around the interior of the tube in the form of a spiral; the fibre being produced, like a root, by having the new matter added continually to the growing point, thereby causing its gradual elongation.

"This action is not throughout the vessel at the same instant, for I have witnessed a vessel having one half laid down with fibre, and in the other part the operation had not been commenced. When the granules have arranged themselves throughout the whole length of the tube, those which were first deposited, and had then some slightly visible space between them, have by this time been reinforced by others or nourished by the contents of the vessel, so that that space is obliterated, the fibre beginning to assume a thread-like shape with defined borders, and sufficiently large to allow of the transmission of white light. When this same action has progressed throughout the entire vessel, the transparency begins to be restored, and what is singular, the entire mass of granules has completely disappeared, appearing as if the exact number and no more had been generated to form the fibre. After the vessel has reached maturity, the liquid contents themselves become absorbed, as happens in the cells of the pith, and the vessel is then empty; and probably from being seen at different periods of its existence in these different states, sometimes full and at others empty, may account for the discrepancies existing among botanists as to the functions these vessels perform."—p. 5.

It appears scarcely necessary to follow the author through the remarks which succeed the passage above quoted; a summary of his views on the direction of vegetable fibre, will, however, we trust, be highly acceptable to physiological botanists.

"It appears to me that the only theory capable of explaining the direction of the fibre, is one that will apply to some peculiar laws existing between the granules themselves and between the granules and the vital force residing in the vessel or cell in which they are contained. There can be no doubt that at first the granules are in the jelly, consequently as they become sufficiently developed they acquire freedom of motion, and attraction commences between the wall of the cell and the granules, and it can be easily imagined how these numerous atoms may be induced to approach to the circumference of the vessel, but the difficulty of the proposition is to account for their doing so in a spiral or other determinate form, and always of the same figure in the same situation in the same plant.

"Some part of the law, I believe, is made tolerably clear, viz., that fibre is composed of granules arranging themselves like beads on a string, which become nourished by the contents of the vessel until a perfect thread is the result, and the direction this takes seems to me to be the result of some special power residing in the vessel under the control of the whole plant, probably electrical; and which is modified in the several vessels I have enumerated: farther than this I believe we cannot go, though nature occasionally alters forms, she seldom varies much in her laws, but what these may be it is forbidden the eye of man at present to detect, and they appear to me, though operating in such minute spaces, to be stamped with as much permanency of power in the formation of these curious and elegant organs, as those laws on a grander scale are in the fashioning of our own frame, or in the maintaining of the stability of the universe."—p. 11.

IV.—*On certain Phenomena observed in the genus Nitella, as illustrative of the peculiar structure recently discovered by Mr. Bowerbank, in a Fossil Wood from the London Clay.* By ARTHUR FARRE, M.D., F.R.S., &c.

Dr. Farre's paper on Nitella is highly interesting, as illustrative, in some degree, of appearances previously detected in fossil wood by Mr. Bowerbank. The author had procured some specimens of Nitella flexilis for the purpose of observing the circulation of the sap; up to the 4th of April this was going on vigorously, but two days afterwards it had entirely ceased, and certain green particles, previously lining the interior of the stem, had shrunk from the parietes, and, together with the green circulatory matter, was collected in irregular masses within the tube. Five days afterwards Dr. Farre found that in many of the joints these irregular masses had resolved themselves into globular bodies of a brown colour, the tubes being left as transparent as glass, and the brown globules appearing as an irregular row of beads in the interior. In almost all the globules was a cup-shaped depression, generally so situated as to face the surface of the tube in the centre of the depression: a small collection of brown granules, of about uniform size with the globules of circulation, was always present. The brown bodies, on being torn open, were found to consist of a very thin investing capsule, filled with the green granules of the plant mixed with mucous fluid.

"It appears then that this remarkable change had taken place within a week after the circulation had been observed to be going on vigorously in the plant. And the nature of the change appears to be this. The green granules which line the internal surface of the living joints desert the parietes, and, together with the green circulating granules of the interior collect together in irregular masses in the centre of the tube, which then resolve themselves into irregular spheres, still retaining the granular outline indicative of their formation by aggregation, but which they afterwards lose on assuming a more perfect spherical form, and become bounded by an investing capsule, which turns of a rich brown colour, while the contained granules retain their original green.

"It is difficult to imagine what purpose is intended to be answered by such a change taking place after all circulation and other evidences of life in the plant have ceased. Yet the idea of such a change being the result of a merely fortuitous arrangement of the component particles of the plant attendant on decomposition, is negatived by the circumstance of the remarkable uniformity and symmetry of the resulting globules, which appear to possess the most definite characters, differing from each other only in size. Nor is the change by any means uniform for the whole plant; for in some parts two of the joints were observed to be in the green state, while the joint situated between them was free from green matter and contained the brown bodies: but this might have resulted from the circulation ceasing earlier in the central joint, and consequently allowing more time for the changes to take place."—p. 23.

V. — *On the Structure of some Tissues possessing Hygrometric Properties.*

By E. J. Quekett, F.L.S., B.S., &c.

Mr. Quekett cites many interesting examples of hygroscopic properties as exemplified in Mosses, Lycopodium lepidophyllum, the seed-vessels of Epilobium, Mesembryanthemum, Rhododendron, Geranium, Banksia, Hura, Avena fatua &c. He then details the structure of the capsule of Cerastium, which we give in his own words.

"Let us take, for example, the capsule of some plant of the order Caryophylleæ, as Cerastium, and it will be found that when that organ approaches maturity, the apex, which was pointed and entire, will open by splitting into five equal valves, which curl outwards, making one complete coil, and always in the same direction; by the application of moisture the valves will resume their original position, and when dry take on the curled form again.

"If one of these valves be examined it will be found to be thin and diaphanous where it forms part of the body of the capsule, but where it is hygroscopic it is horny and opaque. When a section taken from the edge of the valve or curled part longitudinally is examined by the microscope, it will be found that the tissues will be different on the exterior and internal surfaces, both however cellular; but the inner layer, or the cells of the convex border, are of different dimensions from the outer, being neither so large nor having so thick walls, (though they are thicker than ordinary cells); whilst those of the outer layer are almost solid, and the only cavity they have is indicated by thin spaces between a series of lines, the chief one of which is in the direction of the longer axis of the cell, the others connected to it at right angles. These cells are of most curious structure, and form an interesting object for the vegetable anatomist.

"In this arrangement of parts it must be evident that by the shrinking of the tissues of the seed-vessel by loss of moisture, there will occur unequal contraction, and that side will be curved which contracts the most forcibly, and by this curvature one valve must necessarily be removed from the next, evidently showing that the tissues act as unequal antagonists to each other."—p. 26.

Mr. Quekett gives numerous instances in which the great end of disseminating the seeds of plants is accomplished by the hygroscopic properties of their tissues. The subject is one of much interest, and well worthy the attention of the student of nature. In pursuing the enquiry he will almost invariably find the means so admirably adapted to the required end, that not only would it be impossible for human ingenuity to devise an improved plan, but the plans adopted by nature often offer us models and exhibit combinations which have suggested some of our most apt and useful applications of mechanical power.

VII. — *The process of charring Vegetable Tissue as applied to the examination of the Stomata in the Epidermis of Garden Rhubarb.* By the Rev. J. B. Reade, M.A., F.R.S.

The Rev. Mr. Reade's paper on charring vegetable tissue appears to be of great importance, as tending to settle the mooted question of the existence or otherwise of a membranous covering to the stomata of vegetables. The author's conclusions are these : —

"That in the simple uncharred state of the semitransparent tissue there is much room for difference of opinion, so that the eye, fortified by a little previous theory, might most pardonably see the stomata either open or closed.

"That the application of the process of charring proves, beyond a doubt, that the stomata in this tissue of the rhubarb are distinct openings into the hollow chambers of the parenchyma of the leaf.

"That the perforation is the rule and not the exception in the structure.

"And that the exception, where it exists, *i. e.* where the stomata are closed, proves the existence of the overlying membrane discovered and described by Dr. Brown." — p. 41.

Art. LXXXV. — *Varieties.*

203. *Additions to Mr. Flower's List of Plants in the vicinity of Bristol*, (Phytol. 68).

Bromus erectus. Between Horfield and Filton, abundantly.

Danthonia decumbens. Clifton Rocks, sparingly.

Anchusa sempervirens. Between Frenchay and Downend.

Anagallis cœrulea. Cornfield at Horfield.

Samolus Valerandi. Stapleton Quarries, near the river.

Rhamnus catharticus. Hedges at Stoke Gifford.

Viola hirta. Stapleton, Leigh Woods and St. Vincent's Rocks.

Scilla autumnalis. Near bridge, St. Vincent's Rocks.

Fritillaria Meleagris has been gathered in flower two or three different times in a field of Mr. Maule's at Stoke Gifford.

Juncus maritimus. Portishead.

Rumex Hydrolapathum. River-side near bridge at Stapleton.

Triglochin maritimum. Clevedon.

Colchicum autumnale. Fields near Dundry

Paris quadrifolia. Near Shirehampton.

Silene maritima. Clevedon, abundantly.

Alsine marina. Under St. Vincent's rocks.
Cotyledon Umbilicus. Stapleton, Hanham and Easton.
Sedum album. Wick Cliffs & Frenchay.
Spiræa Filipendula. Durdham Down.
Tilia europæa. Leigh Woods.
Mentha rotundifolia. Road-side between Westbury and Horfield.
Teucrium Chamædrys. Blaize Castle.
Linaria spuria and Elatine. Cornfield at Horfield and at Bishpool.
——— *minor.* Crew's Hole.
——— *repens.* Roadside at Nailsea.
Thlaspi arvense. Cornfield at Horfield.
Cochlearia anglica. Rownham, abundant.
Koniga maritima. About Baptist Mills.
Geranium pratense. Week.
——— *lucidum.* Easton.
Althæa officinalis. Portishead.
Vicia sylvatica. Leigh woods.
Hypericum calycinum. Leigh woods.
Carduus eriophorus. Near Bedminster coal-pits.
——— *pratensis.* Filton mead.
Conyza squarrosa. St. Vincent's rocks.
Aster Tripolium. Rownham.
Gymnadenia conopsea. Stoke Gifford.
Habenaria bifolia. Woods at Stapleton and Stoke.
Spiranthes autumnalis. Purdown.
Carex pendula. Near St. Ann's Wood.
—— *Pseudo-cyperus.* Winterbourn.
Mercurialis annua. Crew's hole.
Polypodium vulgare, γ. cambricum. Near Downend.
Ophioglossum vulgatum. Stoke Gifford.
Lycopodium clavatum. Clevedon, abndnt.

Diplotaxis tenuifolia is abundant in St. Phillip's and at Lower Eaton.

Sedum rupestre is very abundant on St. Vincent's Rocks, nor should I have thought it had been introduced, for it is by no means confined to any particular spot, and as it does not seed there, I think it would be difficult for it to spread over such an extent as it does by its roots alone.

Pyrus torminalis grows in Leigh Woods, but I have never seen it on St. Vincent's Rocks.—*Samuel Freeman ; Birmingham, October* 16, 1841.

204. *Rarer Plants near Southampton.* Appended is a list of some of the rarer plants observed at Southampton, in May and June, 1842, with their localities. Those marked with an asterisk were furnished by Mr. T. S. Guyer, of Southampton.

Utricularia vulgaris. Old canal, Milbrook shore.
Circæa Lutetiana. Near Wood Mills.
**Rhynchospora alba.* Botany Bay.
Isolepis fluitans. S. end of Miller's pond.
**Verbascum Blattaria.* Entrance of the avenue.
Drosera longifolia. Botany Bay, near the Fareham road.
Atropa Belladonna. Wood mills ; shore near Itchen and Netley.
Œnanthe Phellandrium. Milbrook shore
Allium oleraceum. Ditto.
Convallaria multiflora. Wood by footpath to Netley, near the abbey.
Daphne Laureola. Ditto.
Sedum anglicum. Netley shore.
*—— *Telephium.* Near a pond on going to Shirley across the fields.
Silene maritima. Shore between Itchen and Netley, in the utmost profusion
Alsine marina. Milbrook shore.
Nymphæa alba. Miller's pond.
Orobanche major. Heath near Miller's pond.
**Linaria repens.* Milbrook shore, beyond the church; also near Shirley church
Diplotaxis tenuifolia. Southampton walls
Lathyrus palustris. Botany Bay.
Carduus pratensis. Southampton Common ; heath by Botany Bay.
Hypericum Androsæmum. Roadside between Wood mills and Northam bridge.
Epipactis latifolia. Southampton Comn.
Myriophyllum verticillatum. Canal by Milbrook shore.
Tamus communis. Southampton Comn.

**Myrica Gale*. Botany Bay, near Southampton, plentiful.
Lomaria Spicant. Botany Bay.
Osmunda regalis. Ditto.
Lastrea dilatata. Ditto.
Athyrium Filix-fœmina. Ditto.
Asplenium Adiantum-nigrum. Fareham Road.
Scolopendrium vulgare. Ditto.
— *W. L. Notcott*, *Fareham, July 6*, 1842.

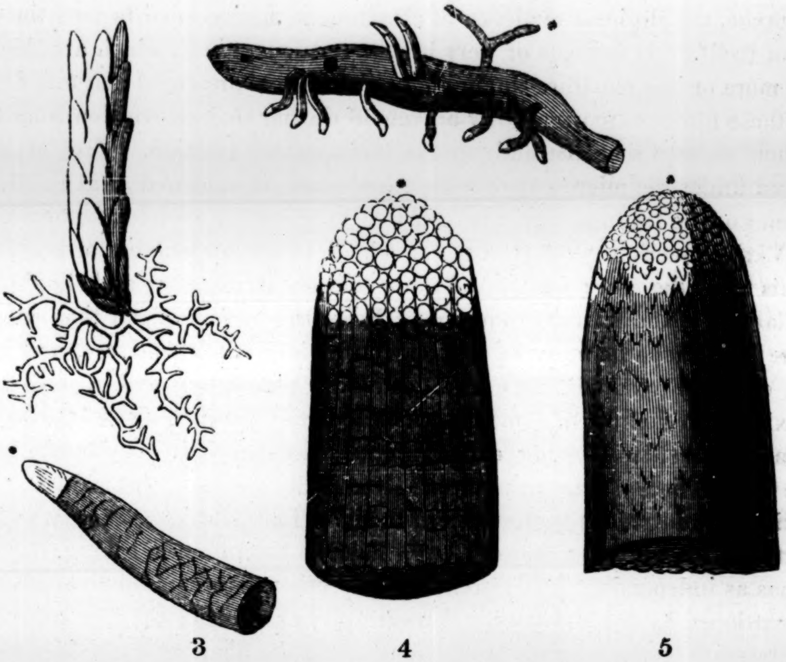

Fig. 1. Lower part of stem of Monotropa, with a portion of the branched root. 2. Part of the root with its attached fibrils, magnified. 3. A fibril detached from the root, as seen under a higher power. 4 & 5. Sections of the end of one of the fibrils, showing the loose cellular tissue of which the tip is composed, highly magnified. The * attached to the various figures indicates the transparent cellular tip of the fibrils, as seen under different powers.

205. *On the Mode of Growth of Monotropa Hypopitys.* The discussion between Messrs. Lees and Wilson on the parasitic nature of Monotropa excited so much interest in my mind, that not only did I regret its sudden termination, but determined on the first opportunity to examine the matter thoroughly for myself. Today, through the kindness of Mr. Wilson, I obtained specimens from Southport, and after some labour and trouble have arrived at the following conclusions, which, as they differ in some measure from those of both the combatants above mentioned, I beg to hand you for a place, if thought worthy of it, in your invaluable Journal. Having carefully removed the outer covering of sand, I came to the matted roots of the willow, which, from their density, and the quantity of sand amongst them, threatened to prove an effectual barrier to my further progress, for an hour was spent in unsuccessful picking and poking at them with a penknife. In this stage of my proceedings a large bowl of water was procured, and by slowly moving the mass, held carefully between my hands, through the water, the stem of the plant being supported by my thumbs, I had soon the gratification of seeing, not only all the sand, but the loose willow-roots and much other foreign matter, deposited in the bowl. The plant was then allowed to drain for a minute, and it afterwards required very little labour to extricate it, with roots, as seen at fig. 1. The plant is not parasitic; it has no organic connexion with

the "nidi" of roots among which its own are developed; but on the other hand it is provided with an independent root of its own, and that, too, as extensive as in most plants of its size: nor are these dense nodules of fibre produced only in its immediate vicinity; several such were examined, and no trace of Monotropa could be found;—they appear to be attached equally to other substances. After examining the willow-roots which were in contact with those of the Monotropa, and on which I could find, in no instance, the slightest evidence of attachment, I proceeded to note the structure of the root itself. It consists of very brittle, tortuous, fibres, which are thickly studded with more or less claviform branches or fibrils (as represented magnified in fig. 2). Many of these fibrils were necessarily broken off during their separation from the mass, but in such cases a scar distinctly marks their former position. One of them was then placed under the microscope; with a low power it appeared as at fig. 3, and the transparency of the tip suggested the idea that they were spongioles formed as in other plants. Various sections were then made, which, on the application of higher powers, proved this to be the case; figs. 4 and 5 are selected from these, and show at once all the peculiarities of the ordinary spongiole. From this it will appear that although the root of the Monotropa be remarkable in structure, it is still a *true root*, and present in sufficient quantity to supply the necessities of the plant; and with regard to its constant proximity to the root of some tree, may it not — the difficulty of the subject and the notion of parasitism having called undue attention to it — be more signally remarkable in our books than in nature? Or is the excrementitious matter of these trees particularly nutritious to it, or it's to them? This I leave to those who have better opportunity to decide the matter; but I have no hesitation in saying, that the Monotropa has as independent an existence as any other plant. The "minute hair-like fibres" mentioned by Mr. Lees were also carefully examined; they have certainly not the appearance of suckers, and though they infest the plant to a considerable extent, are not universally present, indeed I could not assert that they are part of its structure.*—*Thos. G. Rylands; Bewsey House, Warrington, July* 23, 1842.

206. *Cistopteris fragilis* grows abundantly at Castleton; I gathered some beautiful fronds that were growing on the rocks at the entrance of and rather sheltered by the justly celebrated Peak Cavern. — *John Heppenstall; Upperthorpe, near Sheffield, August* 3, 1842.

207. *Lathyrus Aphaca.* I take the liberty of enclosing a specimen of Lathyrus Aphaca with its true leaves, which I believe are rare. It was discovered in 1841 by Mr. W. Newnham, jun., in a corn-field near Farnham, where it was then very plentiful; this year it is by some accident *very* rare. The enclosed was gathered by myself. —*Christopher A. Newnham; Farnham, Surrey, August* 4, 1841.

[We beg our correspondent to accept our thanks for the interesting little specimen sent. The occasional appearance of leaves in this species, especially on young plants, is mentioned by Linnæus, Smith, Hooker, and other authors, but we do not remember having seen any notice of a variation in the form of the stipules when the leaves are present. The young specimen kindly forwarded by Mr. Newnham has two leaves, each consisting of a pair of elliptic-lanceolate leaflets; the stipules accompanying the leaves, instead of being of the usual broad arrow-shaped form, are merely half arrow-shaped. Three of the simple tendrils in a flowering specimen in our own herbarium, bear each a single lanceolate leaflet; but in this case the stipules are all of the usual form.—*Ed.*]

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* Since writing the above Mr. Rylands has more fully investigated these fibres: the result of his researches will appear in our October number.

208. *Inland Localities for Maritime Plants.* I beg to hand you the following notice of plants which have been recently discovered by Mr. George Reece of this city, in localities not hitherto noticed by botanists, so far as I am aware. Arenaria marina is mentioned in Purton's 'Midland Flora' as occurring on Defford Common, where salt springs were discovered many years since, and where salt is now, I believe, manufactured an a small scale. Erodium maritimum is also recorded by Purton as having been found at Stourbridge, Kinver and Bewdley; and to Triglochin palustre is assigned a habitat at Feckenham; but neither Glaux maritima nor Plantago maritima is noticed in the 'Midland Flora.' Arenaria marina, Glaux maritima and Triglochin palustre are found on the banks of the Droitwich Canal; Erodium maritimum and Plantago maritima on Hartlebury Common. Beautiful specimens of these plants have been collected by Mr. Reece, and are now deposited in the herbarium of the Worcestershire Natural-History Society.—*J. Evans; Grove House, Worcester, August* 8, 1842.

209. *Note on Woodsia Ilvensis.* On the 17th of 8th month [August] 1798, my father gathered a single frond of a fern from Crosby-Ravensworth Church, Westmoreland. Being unable to name it he showed it to several botanists in London, who could not decide what it was; Lewis Dillwyn at length sent it to Sir J. E. Smith, who returned the specimen labelled as follows:—

"Polypodium arvonicum,
With. et Fl. Brit. *J. E. Smith.*
P. ilvense, *With.* &
Acrost. ilvense, *Huds.*
(not Linn.)
Acr. alpinum, *Bolt.*"

The original specimen is now in my possession, with Sir J. E. Smith's autograph; the frond is 3¼ inches in length from the bottom of the rachis to the apex, and about 2 inches from the lowest pinnæ to the apex. The church has been pulled down and rebuilt within the last few years.—*Silvanus Thompson; Friends' School, York, 8th Month* 9, 1842.

210. *Enquiry respecting the British Oaks.* Can any of your correspondents inform me what are the true specific distinctions between Quercus Robur, intermedia, and sessiliflora? I have found what I consider to be the three species growing in various localities round Manchester: I have also gathered a number of specimens with the form of the leaves, length of the petioles and situation of the fruit so varied and intermediate, that I cannot with certainty refer them to either species. Several trees near Mottram, from which I procured specimens last month, have the fruit quite sessile and the petioles of the leaves so short as to be scarcely perceptible; whilst specimens of the true sessiliflora from Leigh Woods, near Bristol, given to me by Mr. Grindon, and also specimens gathered by myself in Bredbury Wood, Cheshire, have petioles near an inch in length. I have also specimens from near Mottram, which appear to be hybrids between Q. Robur and intermedia; these have their fruit upon peduncles less than an inch long, but never properly sessile, whilst the leaves are perfectly so. The form which I consider to be the real intermedia of authors, has long petioles to the leaves, and peduncles nearly half an inch in length, but one of the most prominent characters is in the form of the foliage; for whilst in Robur the leaf is much dilated towards the extremity, in intermedia the greatest width exists near the centre, the end

being much narrower in proportion, and the margin being altogether more bluntly cut or divided. I am inclined to believe from the consideration of these several forms that either the number of our native species of oak is at present *undetermined*, or that in reality we possess but *one*.—*Joseph Sidebotham; 26, York St., Manchester, August* 12, 1842.

211. *On Monotropa Hypopitys.* In deference to such high authority as that by which Mr. Newman's views are supported, I have re-examined the subject with much care, and specimens kindly supplied by Mr. Newman in a recent state have been studied in connexion with others obtained from Southport. Before I state the conclusion at which I have arrived, let me acknowledge to my much-esteemed opponents, that although I consider them to have been mistaken, I regard their error as scarcely to be avoided under the circumstances. I have seen a portion of a specimen corresponding with that which they examined, and was myself strongly inclined at the first to coincide in their view; nor was it until after very minute dissection that I perceived any fallacy. The "rhizoma" had apparently an uniform fibrous covering; but in the specimen since received from Mr. Newman, and in those from Southport (examined at the same time) the fibrous matter occurs only in very irregular and detached masses, leaving considerable tracts of the rhizoma quite naked, and this fibrous matter appears to be different on different specimens; but as an able and enthusiastic friend is now engaged in the investigation of this portion of the subject, I shall briefly state that my inference is that the supposed "cuticle of the rhizoma" is really a foreign body. Thin transverse sections of the stem exhibit no trace whatever of a cortical layer; except that the cellular tissue is surrounded by a single indurated stratum of smaller cells of a brown colour, perfectly continuous with the rest of the cellular tissue. No membranous cuticle could be detected, by scraping or otherwise, upon the stem. On the rhizoma something like a cuticle was at times found in parts not coated with fibrous matter; but this, besides being immeasurably thinner, is different in structure from the cuticle referred to in Mr. Newman's paper* (Phytol. 298), and can only be detected by scraping the surface of the rhizoma. In some cases it seems to be quite absent, and may therefore not belong to the plant. Mr. Newman's first and second reasons do not appear to be well founded. Wherever the fibrous matter occurs I find it matted together, and attached to the rhizoma in such a manner as to forbid the idea of organic connexion; and if there be any difference in the thickness of the ends of each fibre, which is very doubtful, the position of the parts is at variance with Mr. Newman's idea. The fibres indeed are often united together into fasciculi, presenting an appearance very apt to mislead. After careful inspection of the colourless extremities of the "rhizoma," I retain the opinion expressed in my former remarks. In opposition to the opinion that they are only growing extremities of the divisions of a rhizoma, I would remark that I know of no instance where the growing parts of a rhizoma have a downward or backward direction; also that the supposed growing extremities never develope themselves into scaly buds:—these are always laterally inserted, and, if I mistake not, are at first immersed in the substance of the root, like the buds in the tuber of a potato. On this point my former remarks require some correction.—*W. Wilson; Warrington, August* 12, 1842.

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* Considerably more than $\frac{1}{2000}$ of an inch in thickness, and therefore easily seen when a section of the rhizoma is under the microscope.

212. *On Carex tenella.* Far be it from me to condemn that liberal criticism, the object of which is the attainment or communication of truth. Next to the relation of interesting facts, I know of nothing more suited to the pages of 'The Phytologist' than judicious and candid strictures on standard works relating to Botany; I trust we shall see many such, and that Mr. Gibson will frequently direct his abilities into that channel. In my former remarks I did not intend more than to show that the author of the 'British Flora' is not chargeable with the neglect or inadvertence imputed to him. The account given by Sir J. E. Smith was referred to, proving that an experienced botanist, with superior advantages for forming a correct judgement, and with peculiar inducements to be deliberate, may see or think he sees, in Schkuhr's figure of Carex tenella, something which is not apparent to Mr. Gibson. The question indeed is properly one between him and Sir J. E. Smith only; and if it should prove, as I believe it will, that the question of doubt in 'British Flora' was confined to the Scottish specimen called C. tenella by Smith, Mr. G. must be sensible that some of his remarks were needless, as bearing upon a point not under dispute. Admitting Mr. G. to be right in his view of Schkuhr's figure, it follows that Smith must have been wrong, and if so, he may have been also in error as to the Scottish specimen. I could point out parallel cases where Sir J. E. Smith has too hastily assumed the identity of essentially different plants; and it is probable that if he possessed only a solitary specimen, his examination would, in this case, be rather superficial. To ascertain the existence of only two stamens, dissection would be requisite, and to dissect would be to mutilate what he might wish to preserve uninjured. The fruit also might be so immature as not to exhibit the character of the species. The author of 'British Flora' was not bound to admit that specimen, which he had never seen, on the mere authority of one who reported that Schkuhr's figure could not be implicitly relied on; and it would not be unreasonable in Mr. G. to have some misgivings on the same subject. Let it be remembered also that Wahlenberg and Willdenow refer the whole figure to C. loliacea, a species which, notwithstanding what is said of it by Smith, may possibly have fruit corresponding with the figure. To determine this question recourse must be had to the original description, and perhaps to an authentic specimen of C. loliacea.—*Id.*

213. *Note on a Criticism in Taylor's Annals.** Allow me to say in reference to a note in the July number of the 'Annals and Magazine of Natural History,' (p. 421),

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* The following is the criticism referred to by Mr. Gibson. "Notes on *Arenaria rubra*, *marina* and *media;* by S. Gibson, Esq. [The two former appear to us to be distinct species, but we cannot agree with Mr. Gibson in separating the latter from *marina*, as our own observations would lead us to believe that the characters drawn from the seeds and length of the capsule are not constant. We trust that we shall not be considered presumptuous if we hint to this very accurate observer, that a more frequent reference to the writings of continental botanists would be desirable. We say this without the least wish to detract from the value of Mr. Gibson's papers, but merely to avoid the introduction of additional synonyms into our already encumbered science, of which an instance occurred in a late number of the 'Phytologist,' where a *supposed* new species of *Monotropa* is named and described, which had long since received several denominations in botanical works.]"—From a notice of 'The Phytologist,' in the 'Annals and Magazine of Natural History,' ix. 421.

that I have this season, with a determination to avoid any preconceived opinion on Arenaria marina and media, made all the enquiry that I possibly could; the result of this enquiry is that I have not been able to find anything opposed to what I have before said on the subject, (Phytol. 217). After assiduously examining these plants, I may be excused for observing that I cannot participate in the writer's opinion; for notwithstanding the possibility of there being some little variation in the seeds (but such I have never seen), I have not the least doubt of their *specific* distinction. I might just as confidently state the rubra to be identical, if I were to find some little difference in the seeds of that plant, and indeed it would appear that the seeds of rubra do vary most strangely, as they are described by Leighton and others as being angular, whereas all that I have seen are somewhat pyriform; perhaps the Arenaria rubra described by authors may be a plant which I have never seen, as it would appear that the rubra of authors is something very like marina, since Mr. Babington tells us that he is inclined to believe them to be two species, but that he has been unable satisfactorily to distinguish them, ('Primitiæ Floræ Sarnicæ,' p. 16). So far as regards the Monotropa, I am quite willing to give up for a better one the name I have used to distinguish the two forms of that plant, and shall leave to botanists the decision of the question how far they may be distinct as species. I am well aware of the evil attending the introduction of additional synonymes, and am much surprised to find that botanists who ought to know better are carrying out the thing to the greatest length; as I see that we have in Baines's 'Flora of Yorkshire,' published in 1840, a description of Aira cæspitosa, var. *β. rigida;* in Leighton's 'Flora of Shropshire,' published in 1841, we have an Aira cæspitosa, var. *β. major;* in the Edinburgh Botanical Society's Catalogue, second edition, 1841, we have an Aira cæspitosa, var. *β. vivipara;* and if we look into a few works on our British plants, we shall find that in many instances the same plant has a different name in each. In Lightfoot's 'Flora Scotica' we have a plant under the name of Arundo arenaria; in the 4th edition of Withering's Botany we have the same plant called Calamagrostis arenaria, and in the 5th edition of the same work Arundo arenaria; in Gray's Botany it is called Psamma arenaria, in Smith's 'English Flora' Arundo arenaria; by Sir W. J. Hooker it is called Ammophila arundinacea; in the Edinburgh Society's new Catalogue we find it to be AMMOPHILA ARENARIA. Should we wish to trace this plant into the works of continental writers, we shall find it under such names as Spartum anglicanum, &c. But as I have no wish to go beyond the bounds of my own country, I will trace the Ammophila a little further in the works of my countrymen; the above name I find used in 1802 for *a genus of Hymenopterous insects* by Kirby, the same name has been retained by Turton, Sowerby, Leach, Samouelle, Stephens, &c. The above name AMMOPHILA ARENARIA may be convenient to the Edinburgh Botanical Society for the *Sand-marram*, but for me as an entomologist it is not convenient, for if I consult Donovan on that subject, I find the very same name—AMMOPHILA ARENARIA applied to one of our *Sand Wasps*. And perhaps botanists will soon lose their antiquated generic name Ficus, as I see Mr. Cumberland of Bristol is now using it for a genus of *fossil Crinoidea*. The editors of the 'Annals and Magazine' say that they trust they will not be thought presumptuous in hinting to me that a more frequent reference to the writings of continental botanists is desirable. In reply to this I would tell them (as it appears they have forgotten it) that all botanists are not equally fortunate in being so placed as to have an opportunity of consulting such books; and if I may be allowed to speak on the introduction of synonymes, we have a fine specimen of this in the Shropshire Flora. The four species of Arenaria found in that county are there placed under four different generic names; the Arenaria rubra of Smith being Lepigonum rubrum in Leighton's Flora and the Alsine rubra of the Edinburgh Society's new Catalogue. — *Samuel Gibson; Hebden Bridge, August* 15, 1842.

214. *Note on Carex axillaris and remota.* Allow me to return my best thanks for the information given by Mr. Wilson on the two Carices, (Phytol. 299). I have carefully looked over the descriptions and separated the characters assigned to each; and leaving out all the superfluous matter they will stand thus: —

1. *Carex axillaris.* *Leaves* flattened. *Bracteas* variable in length, second very small, with a membranous base, upper part rough, very narrow and awn-like, all of them auricled at the base. *Rachis* perfectly straight, with three rough angles. *Glumes* roundish-ovate, tipped with a very short rough point.

2. *Carex remota.* *Leaves* bent in at the sides, so as to be almost semicylindrical. *Bracteas* generally with a pale very obscure ligula, passing completely round the common stalk. [*Rachis*] zigzag, in the upper part with two rough angles. *Glumes* ovate-acuminate, narrower than the fruit.

Mr. Wilson tells us that the rachis in *remota* is zigzag, and in *axillaris* perfectly straight. Dr. Wood tells us that the lower bractea in axillaris forms as it were a continuation of the stem as regards its direction. Now if the Dr. be correct in this point the stem must be pushed out to give room for the spikelet, and therefore would be at variance with Mr. W.'s straight rachis. Mr. W. tells us that the leaves in axillaris are *flat*, the Dr. tells us that they are *channelled*—but stop, perhaps I am leaving out something of importance, he says "*plane* though *channelled*," &c.; here I am a loss to know how a plane leaf can be channelled. Whatever praise might be due to Dr. Goodenough from his first paper on our British Carices, I do think that he robbed himself of such praise by writing the following passage.—"I have stated axillaris as having the capsule divided at the summit, and remota as having it entire; but this is not constant. I believe all Carices dispose of their seeds by the opening of the point of their capsule, this opening is observable in some very early, in others not till quite old. In the former the capsule is described as opening; in the latter, because it is not seen but in very advanced age, it is mentioned as closed."—(Trans. Linn. Soc. iii. 76). Whatever Mr. W. may think of the above passage, it was written when the subject had, or at least ought to have been, fully investigated. However Mr. W. may be surprised at my opinion on what Dr. Goodenough has said on the capsules of our Carices, I now say that if ever he had investigated the fruit of one Carex, he would have known that when the fruit is first formed, that the opening, if there be any, is very conspicuous, and may be seen surrounding the style, with the stigmas protruding therefrom; and as soon as the capsule is discernible, it will be seen whether its beak be entire or cloven, as it never changes in that respect after it is first formed. So far as regards my quotation from the 'English [British] Flora,' I would ask Mr. W. if Sir W. J. Hooker had not accurately described C. axillaris in the first edition of that work, or has he corrected himself in order that his description may better agree with that of Sir James Edward Smith? Mr. W. tells us that the bracteas in C. axillaris are by no means constant in their length; if he be correct in this, Sir W. Hooker had made no mistake, and therefore we could have no need of any such correction. Mr. W. tells us that the passage I have quoted from the 'English Flora' without the word "perhaps," is sheer nonsense; I would say that the passage as it stands in the 'English Flora' is something very like nonsense, for it amounts to nothing more than to say it *may or may not be so.* What Sir J. E. Smith might have had in his mind when he wrote the passage I know not; but I do disapprove of the use of such passages in descriptions of plants. But as I have said before, in my enquiry on the two species of Carex, my real difficulty in making out the two may perhaps arise from my never having seen them both; but here I must say (omitting Dr. Goodenough's description of the capsule of his remota), that I have specimens in my possession that will answer to every description that I have seen, and many other forms that are not described at all in any work. Our Carex axillaris, remota, angustifolia, cæspitosa, aquatilis, stricta, acuta, and others, require a strict investigation, in order that the species may be correctly made out, and the mere varieties arranged as such. To describe the extremes of any variable plant is quite easy, but when we have got a regular gradation from the two extremes, then the difficulty occurs.—*Id.*

[We trust that the discussion on this subject will now be allowed to terminate: had Mr. Gibson's only object been to obtain information on a doubtful point, he would, we think, have been satisfied with acknowledging that already afforded, which appears quite sufficient to enable any one to distinguish Carex axillaris from every state of C. remota. We have thought it unnecessary to extend Mr. Gibson's paper beyond its present limits, by printing some remarks therein contained on two specimens of Carex remota which accompanied it: the only difference we can perceive between these specimens is, that one is rather more slender than the other.—*Ed.*]

215. *Note on the Stomata of Equisetum hyemale.* I would remark on what is said of the stomata of Equisetum hyemale (Phytol. 278), that they are immersed in *cavities*, not in elevated disks. There are two series of stomata in each furrow, one immediately on each side of the ridge, and somewhat concealed under it when in a dry state. The structure of E. variegatum is similar, but less conspicuous.—*W. Wilson; Warrington, Aug.* 15, 1842.*

ART. LXXXVI.—*Proceedings of Societies.*

BOTANICAL SOCIETY OF LONDON.

August 5, 1842.—John Reynolds, Esq., Treasurer, in the chair. The following donations were announced:—British plants from the Rev. T. Butler, Mr. John Pearson, Mr. Arthur Henfrey, Miss Anna Worsley and Mr. Samuel Freeman. American plants from Mr. O. Rich. British Mosses from Mr. I. F. Hollings. Specimens of *Schistostega pennata*, collected in Nottingham forest by Mr. Joseph Sidebotham, were exhibited and presented by him.

A note was read from Mr. Adam White, stating that he had found specimens of *Dentaria bulbifera* in Chesham Bois Wood, Buckinghamshire. Mr. Thomas Sansom, Librarian, exhibited a monstrosity of *Rosa centifolia*, Linn., in which a second flower was developed from the centre of the first. Mr. W. H. White communicated a paper, being a Report of the botanical state of the Mauritius; translated from the Eighth Annual Report of the Natural-History Society of that island.—*G. E. D.*

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* In a letter to E. Newman; who begs to thank Mr. Wilson for this very necessary and important correction, and requests the reader will also correct a repetition of the error at p. 308 of the present number.